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(54) APPARATUS FOR WELDING HANDLES ONTO WEBS FOR FORMING CARRIER BAGS

(71) We, WINDMÖLLER & HÖLSCHER, a German Kommanditgesellschaft, of 48-52 Münsterstrasse, 454 Lengerich, Westphalia, Germany, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to apparatus for welding thermoplastics handles on webs of thermoplastics material in machines for making carrier bags.

Carrier bags having handles at their mouths are made from webs of thermoplastics film having two layers which are connected to one another at one side and folded over inwardly at the free edges, the web being intermittently fed in a longitudinal direction and provided with transverse severing weld lines at intervals along its length to form the individual carrier bags. The handles are introduced laterally through the open edge of the web and are welded in position whilst the web is stationary at a welding station equipped with welding jaws that are applied to the exterior of the web at the location of the ends of the handles that are to be welded on. Bearing in mind that the web is folded over at its free edges, the welding heat from the jaws must therefore pass through at least two layers of the film before it reaches the ends of the handles. Since the film does not have good heat-conducting properties and it remains stationary for only very short periods if a high production rate is to be obtained for the bag-making machinery, the welding jaws must be heated to high temperatures so that the welding temperature at the position of welding is achieved in the limited available time. However, the temperature of the welding jaws must not exceed that which would damage the film that will subsequently form the walls of the carrier bags. Accordingly, the production rate of the bag-making machinery is limited by the maximum permissible temperature of the welding jaws.

The invention aims to permit the maximum temperature of the welding jaws to be reduced without detrimentally influencing the optimum welding temperature, so that the production rate of the bag-making machine can be improved.

According to the invention, there is provided apparatus for welding thermoplastics handles onto webs of thermoplastics material for forming carrier bags wherein the thermoplastics material has two layers connected to one another at one side edge and open at the opposite side edge and folded over inwardly at the free edges, wherein the apparatus comprises a pre-heating station equipped with a heated tongue for projecting between the layers of the web at the open side, and a welding station disposed downstream of the pre-heating station for welding handles to the web at centre-to-centre spacings equivalent to the desired bag width. Preferably, the tongue is heated by two heating elements which are associated with backing members that can be applied to the exterior of the web.

By means of the pre-heating tongue, the welding points within the mouths of the bags have heat applied to them directly. The heat to be supplied by the welding jaws to achieve the required welding temperature is therefore less, and the welding temperature is reached in a much shorter time than would be possible with intensively heated welding jaws in cases where there is no pre-heating.

An example of the invention is illustrated in the accompanying diagrammatic drawings in which Figs. 1 and 2 are respectively a side elevation and plan view of a bag-making machine.

[Price 33p]

The illustrated bag-making machine is supplied with a web of thermoplastic film H having two layers which are connected to one another at one side and folded over inwardly at the other side to form longitudinal flaps (see the extreme left-hand side of Fig. 2). The machine comprises a pair of intermittently rotated feed rollers 1 for intermittently advancing the web in the direction of the arrow *a* in steps equal to the desired width *b* of each carrier bag T to be made. Upstream of the feed rollers 1 there is a pre-heating station 2 and a welding station 3 for welding handles G to the web at intervals along its length. The centre-to-centre spacing of the pre-heating and welding stations from one another is equal to *b* or a whole number muliple of *b* (*n.b.*). A transverse welding and severing station 4 of known construction is provided downstream of the feed rollers at a centre-to-centre spacing from the welding station of $b+b/2$ or $n.b.+b/2$. The transverse welding and severing station is effective to produce transverse weld seams N to define the carrier bags and simultaneously to sever successive carrier bags from the web.

The pre-heating station 2 comprises a stationary tongue 5 which projects between the layers of the web at its open side where the inwardly folded flaps are provided. Inside the tongue there are heating elements 6, 6′ shaped and arranged to conform to the shape and arrangement of the ends of the handles G that are to be welded on. The heat from the heating elements 6, 6′ is transmitted to the inwardly folded flaps. The heating elements are associated with backing members 7, 7′ that can be applied to and moved away from the exterior of the web H.

The welding station 3 comprises a pair of welding jaws 8,8′ which are movable towards and away from the web and which are equipped with heating elements 9, 9′ that are also shaped and arranged to conform to the shape and arrangement of the ends of the handles G. The welding jaws 8, 8′ supply heat to the exterior of the web.

Supply means (not shown) are provided near the welding station 3 for inserting pairs of the handles G, with their ends foremost, between the layers of the web in the direction of the arrow *c* so that they respectively underlie and overlie the heating elements 9 and 9′ of the welding jaws 8 and 8′.

The web H is unwound from a supply reel by a continuously rotating pair of feed rollers 10 and, by means of a dancer roller 11, laid into a taut loop from which the web is fed by the feed rollers 1 in steps equal to the desired width *b* of the carrier bags to be made. Whenever the web is stationary, the inwardly folded flaps are pre-heated by the pre-heating station 2 at the cross-hatched positions *x* indicated in Fig. 2. During the subsequent feeding step, these positions *x* arrive at the welding station 3 where the ends of the pair of handles G are inserted and the welding jaws 8, 8′ are applied to the exterior of the web. At their confronting faces, the handles are provided with a silicone layer, so that the handles will not be welded to one another as their ends are being welded to the film H.

During every standstill of the web, a completed carrier bag T is severed from the web by the transverse welding and severing station 4 and carried away at an accelerated speed by a double belt conveyor 12.

WHAT WE CLAIM IS:—

1. Apparatus for welding thermoplastics handles onto webs of thermoplastics material for forming carrier bags, wherein the thermoplastics material has two layers connected to one another at one side edge and open at the opposite side edge and folded over inwardly at the free edges, wherein the apparatus comprises a pre-heating station equipped with a heated tongue for projecting between the layers of the web at the open side, and a welding station disposed downstream of the pre-heating station for welding handles to the web at centre-to-centre spacings equivalent to the desired bag width.

2. Apparatus according to claim 1, wherein the tongue is heated by two heating elements which are associated with backing members that can be applied to the exterior of the web.

3. Welding apparatus substantially as described herein with reference to the accompanying drawings.

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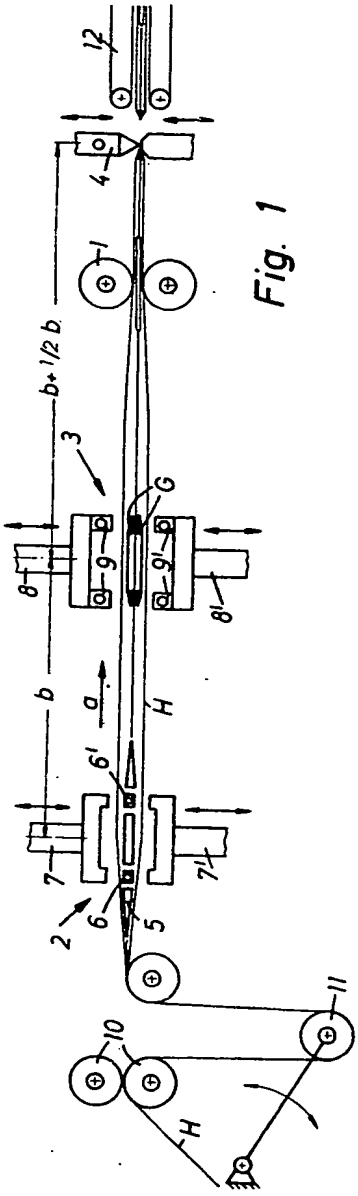

Fig. 1

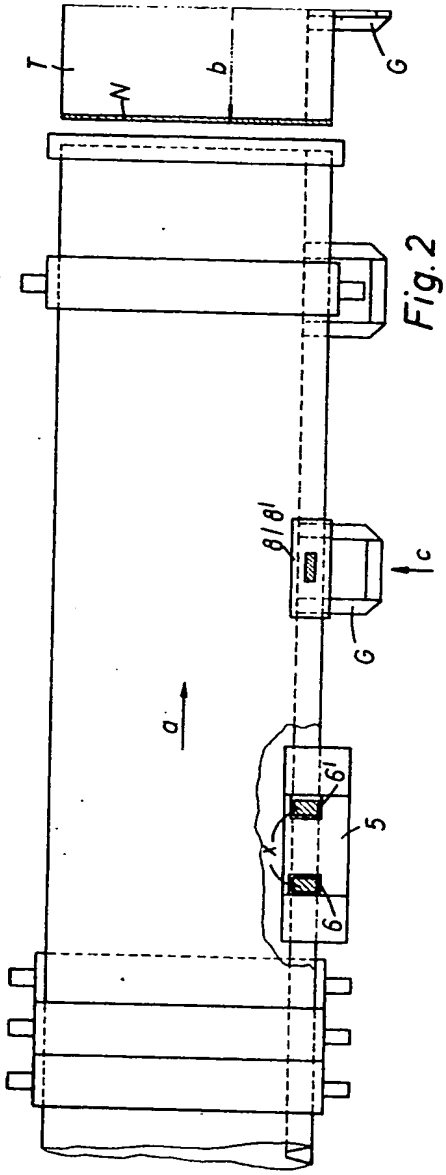

Fig. 2